Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: February 2010

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity, which is referred as "specific conductance" (SC). The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below to ensure salinity standards are met to protect habitat for waterfowl in managed wetlands:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of February, 2010, **deficiency standard apply and salinity conditions at only two compliance stations (i.e. S21 and S42)** are in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of February was determined for each compliance station by comparing the progressive daily mean of high-tide SC with respective standards. The standard for compliance stations S-21 and S-42 was 15.6 mS/cm during February 2010. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

Outflow for February 2010 started off above 35,000 cfs with carryover from January and dropped down to about 27,000 cfs in early part of February. Soon after, several precipitation events resulted outflow to peak to about 40,000 cfs in mid-February and gradually dropping of to about 17,000 cfs in late February. Additional storm events continued in late February with outflow on the rise again for the month and ended on a high note of about 35,000 cfs. Outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for February 2010 is listed below:

Month	Mean NDOI (cubic feet per second)
February	28,039

2.3 Rainfall

Precipitation events occurred in the early and late half of February. The largest precipitation amount occurred in late February with a daily total of 1.62 inches and the second largest occurred in early half of February with a daily total of 0.74 inches. The monthly total is shown below:

Month	Total Rainfall (inches)
February	4.14

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during February 2010 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
February 1 – 28	3 Open	In	Open

Gate operation was not needed in February due to outflow carryover from January and good amount of precipitation activities in February enough to bring down salinity throughout the marsh and under control.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operations of the SMSCG and flashboard configurations.

3.2 Observations and Trends

Conditions during the Reporting Period

During February 2020 PDM salinity levels at compliance stations Collinsville(C-2), National Steel(S-64), Beldons(S-49), and Volanti(S-42) were no higher than 5.0 mS/cm as shown in Figure 1. Salinity levels at C-2 and S64 were below 1.0 at the start of the month and remain that way throughout the month. S49, S42, and S21 started off the month between 4.0 mS/cm and 5.0 mS/cm and all stations dropped slightly due to rainfall events in the early half of the month resulting salinity levels to remain below 4.0 mS/cm at the end of the month with another dose of rainfalls in the late February. At the start of February, salinity levels at control stations S35 and S97 were 4.0 mS/cm and 6.1 mS/cm, respectively. S35 salinity dropped on February 7 due to rainfall events and increase a bit thereafter but remained stable, 6.0 mS/cm, to end the month. S97 salinity levels increased to about 6.5 mS/cm by mid-February and remained there for the remainder of the month. The salinity increase at S97 indicates that rainfall events that occurred the early half of February didn't pass the area because S97 is highly influenced by creek runoffs. Overall, salinity levels were very low throughout the marsh that meeting regulatory and contractual obligations were not a concern.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for February 2010 were compared with means for those months during the previous nine years (Figure 4).

Mean salinity pattern of all compliance and monitoring stations resemble that of the previous 2005 year levels, but at a slightly higher magnitude as shown in Figure 4. Compared to previous nine years, February 2010 salinity levels overall were ranked sixth in high Specific Conductance. Unlike past years, the higher salinity for past February like 2009 is probably a result of extremely dry antecedent hydrologic conditions along with reduced gate operations for fish concerns with the exception of years with a wet February like 2010.

Table 1

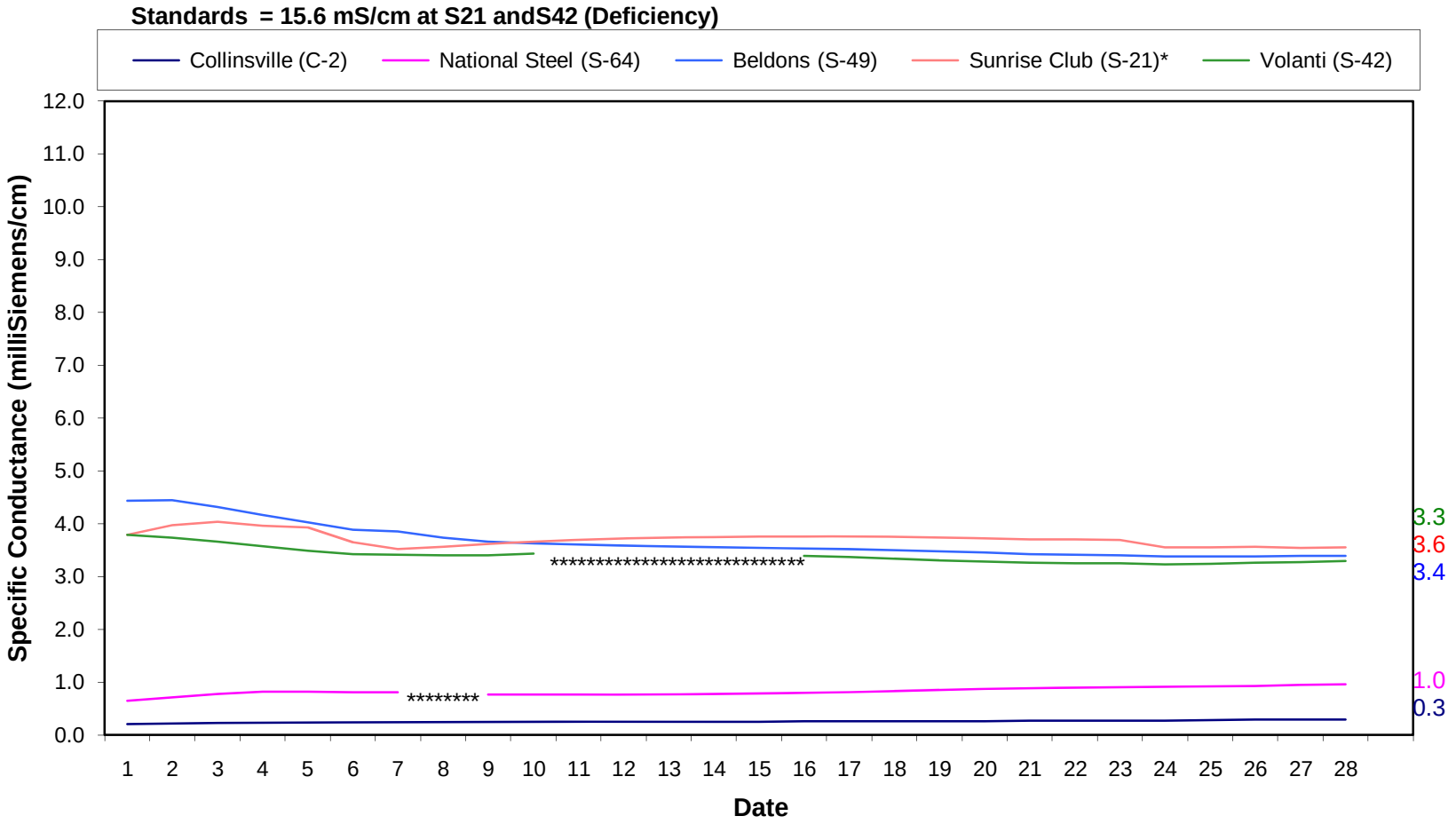
Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations

February 2010

Station	Specific Conductance (mS/cm)*	Deficiency Standard	Deficiency Standard meet?
C-2**	0.3	n/a	n/a
S-64	0.9	n/a	n/a
S-49	3.4	n/a	n/a
S-42***	3.3	15.6	Yes
S-21***	3.6	15.6	Yes

*milliSiemens per centimeter
**The representative data from nearby USBR station is used in lieu of data from station C-2.
***As define in D1641 and RSMPA, monthly standard only apply to compliance stations, S-42 and S-21 during deficiency year.

Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance
February 2010



*******missing data due to equipment problem at S64 and S42.

Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance
February 2010

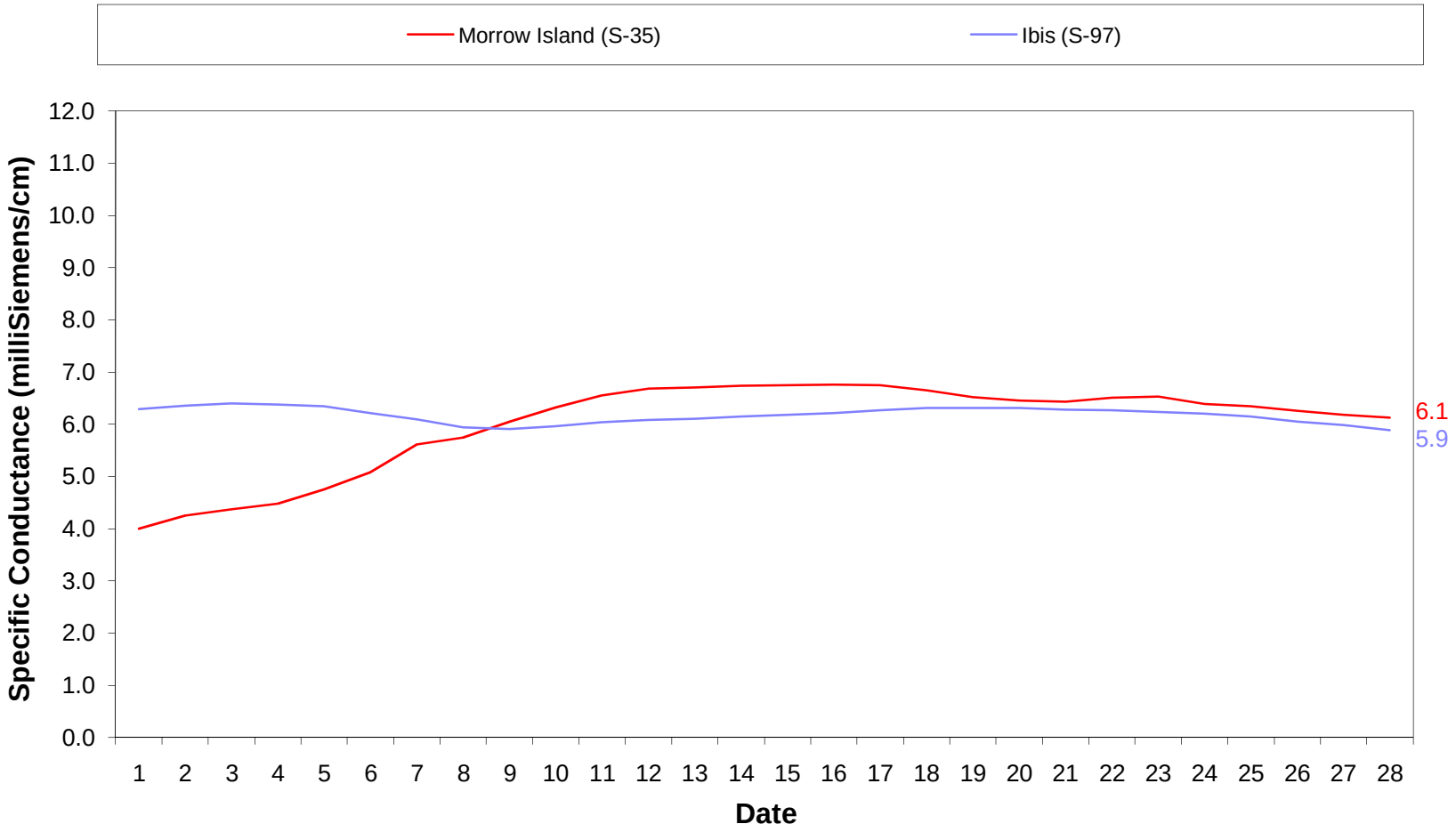
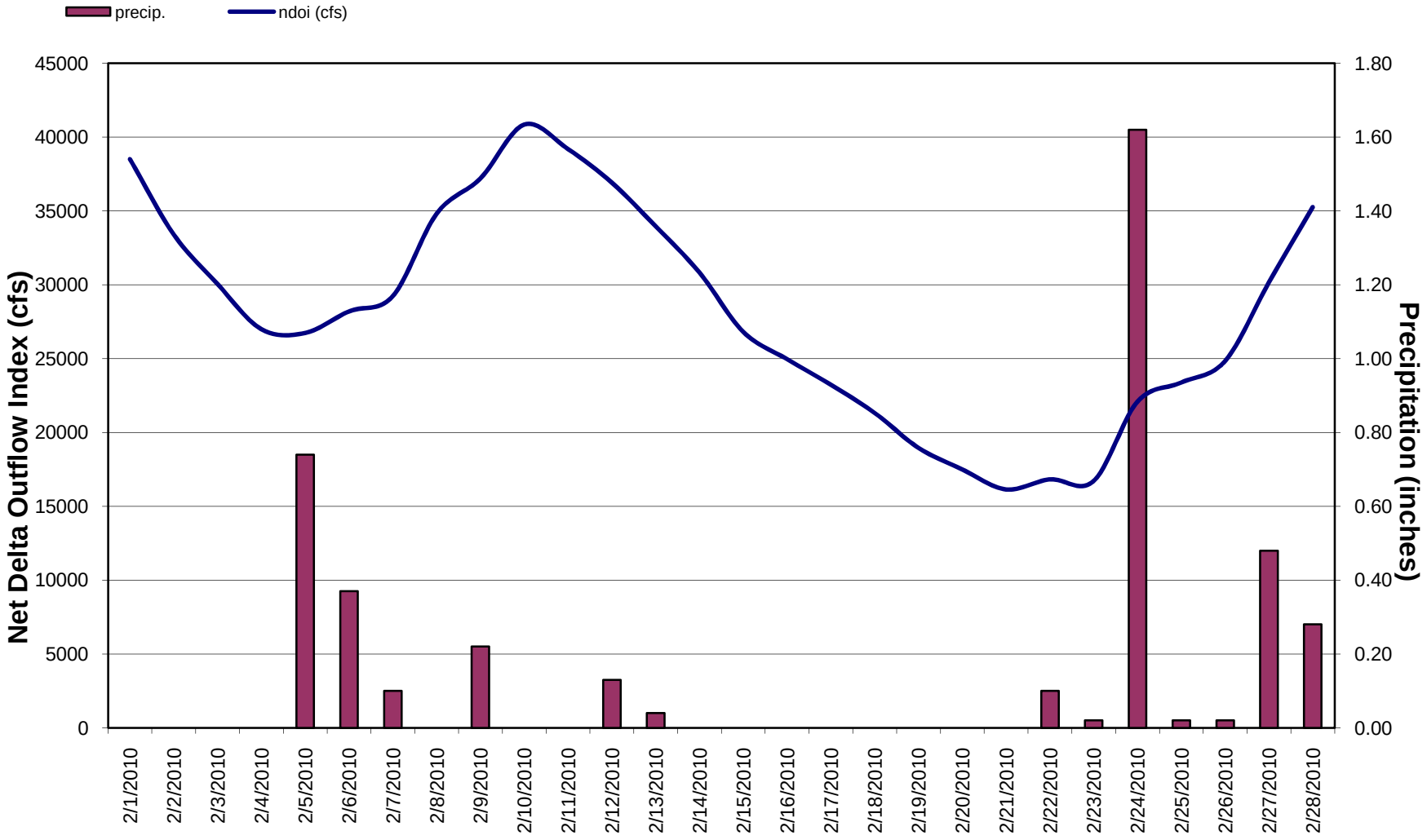
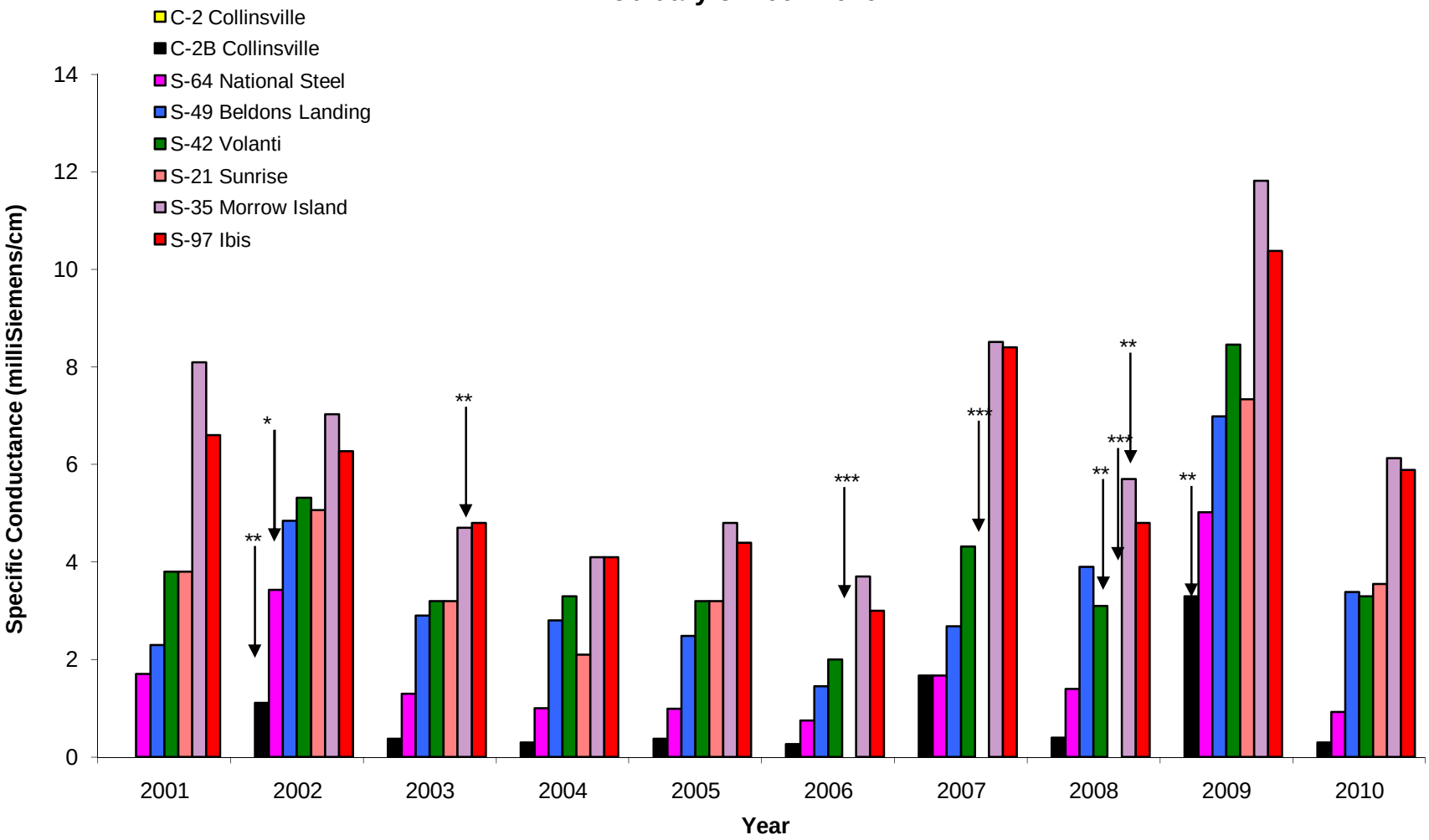


Figure 3. Daily Net Delta Outflow Index and Precipitation*
February 2010

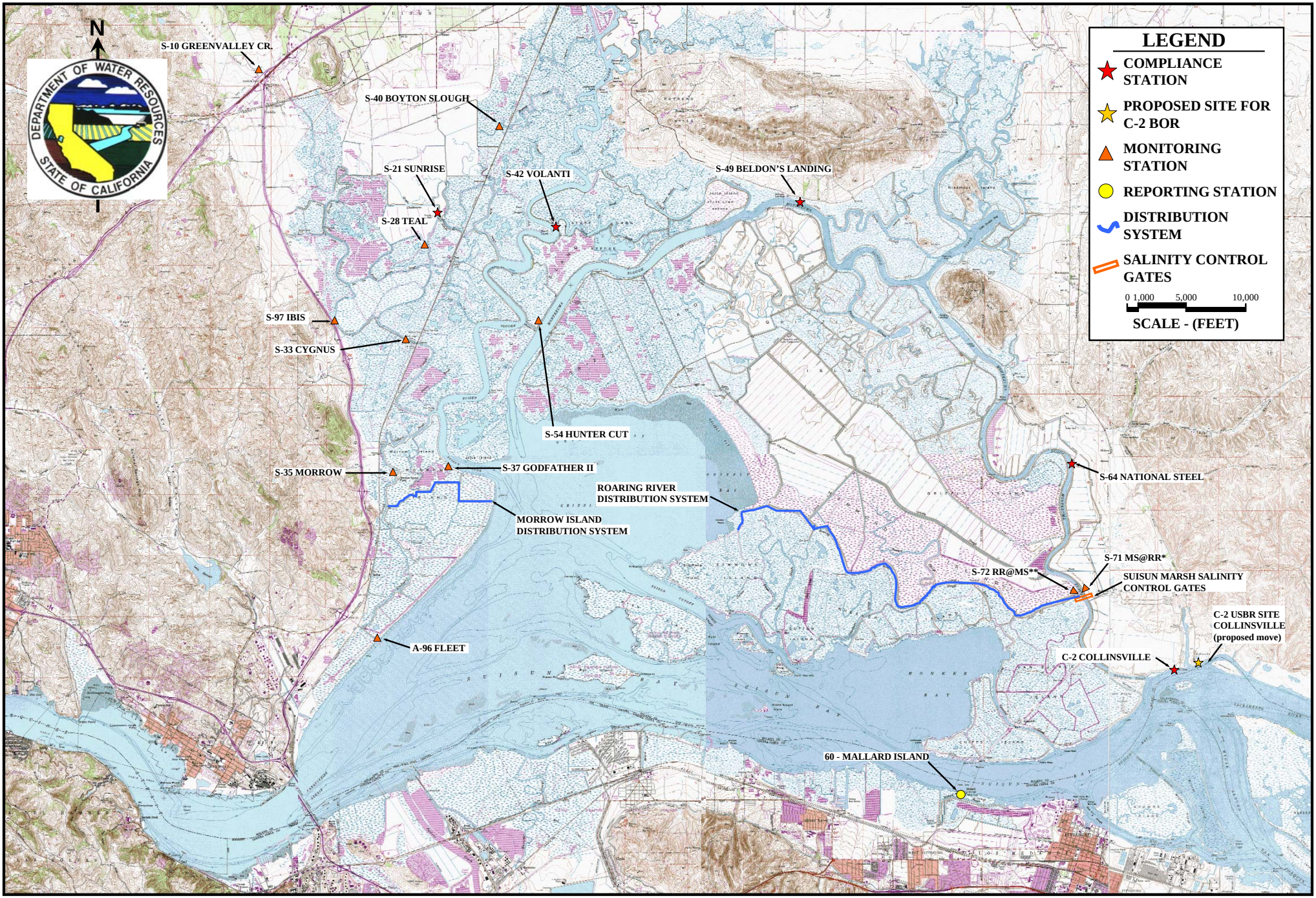


*Preliminary DWR, O&M Delta Outflow data and precipitation from Fairfield Water Treatment Plant.

Figure 4. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations February of 2001-2010



*Representative data from nearby USBR station is used in lieu of station C-2 from 2002 and thereafter.
**Data missing due to equipment failure or power outage. Number of missing data is small enough not to alter end of month value.
***Data not available due to flooded levees and inaccessible roads.



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES